

## VERTEX-ANTIMAGIC TOTAL LABELINGS OF GRAPHS

MARTIN BAČA

*Department of Applied Mathematics*  
*Technical University, 04200 Košice, Slovak Republic*

**e-mail:** Martin.Baca@tuke.sk

FRANÇOIS BERTAULT

*Department of Computer Science and Software Engineering*  
*University of Newcastle, NSW 2308, Australia*

**e-mail:** francois@cs.newcastle.edu.au

JAMES A. MACDOUGALL

*Department of Mathematics*  
*University of Newcastle, NSW 2308, Australia*

**e-mail:** jmacd@math.newcastle.edu.au

MIRKA MILLER, RINOVIA SIMANJUNTAK AND SLAMIN

*Department of Computer Science and Software Engineering*  
*University of Newcastle, NSW 2308, Australia*

**e-mail:** {mirka,rino,slamin}@cs.newcastle.edu.au

### Abstract

In this paper we introduce a new type of graph labeling for a graph  $G(V, E)$  called an  $(a, d)$ -vertex-antimagic total labeling. In this labeling we assign to the vertices and edges the consecutive integers from 1 to  $|V| + |E|$  and calculate the sum of labels at each vertex, i.e., the vertex label added to the labels on its incident edges. These sums form an arithmetical progression with initial term  $a$  and common difference  $d$ .

We investigate basic properties of these labelings, show their relationships with several other previously studied graph labelings, and